

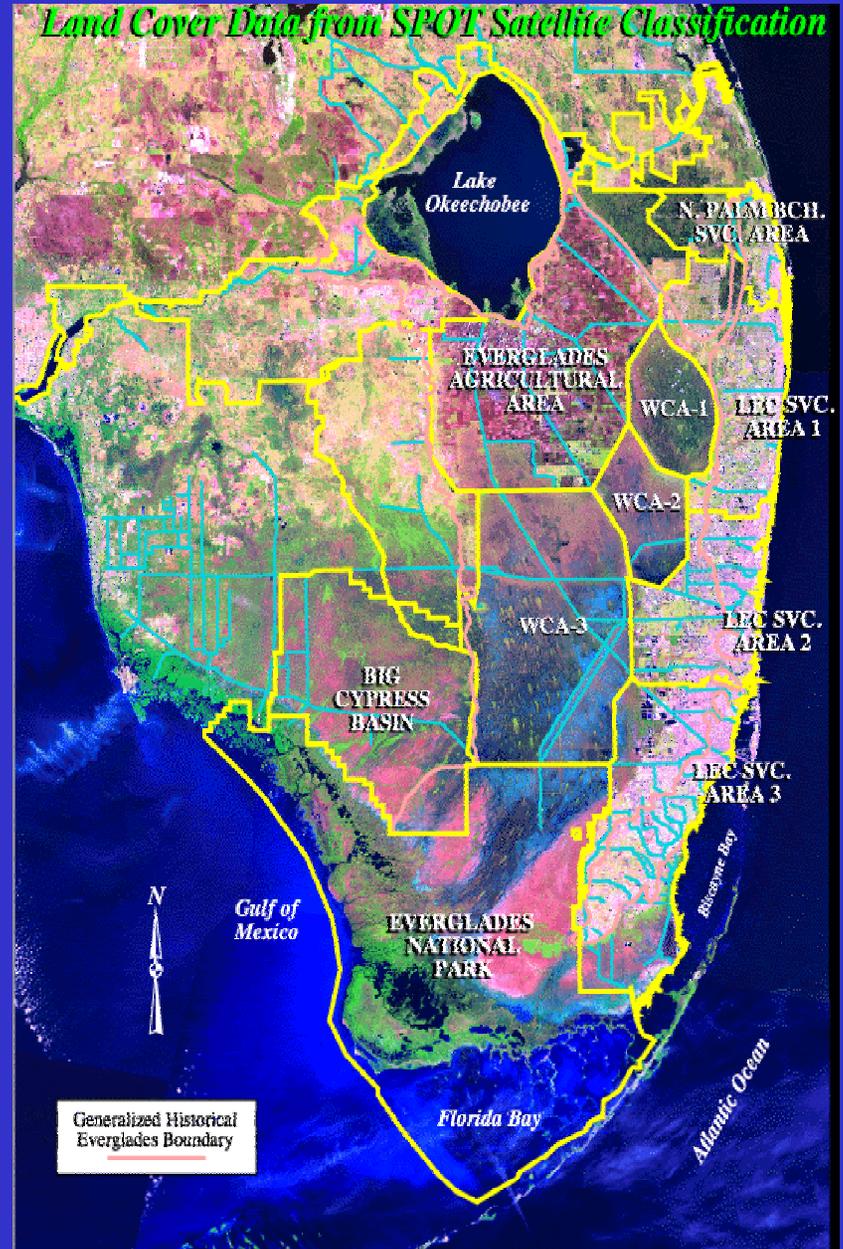
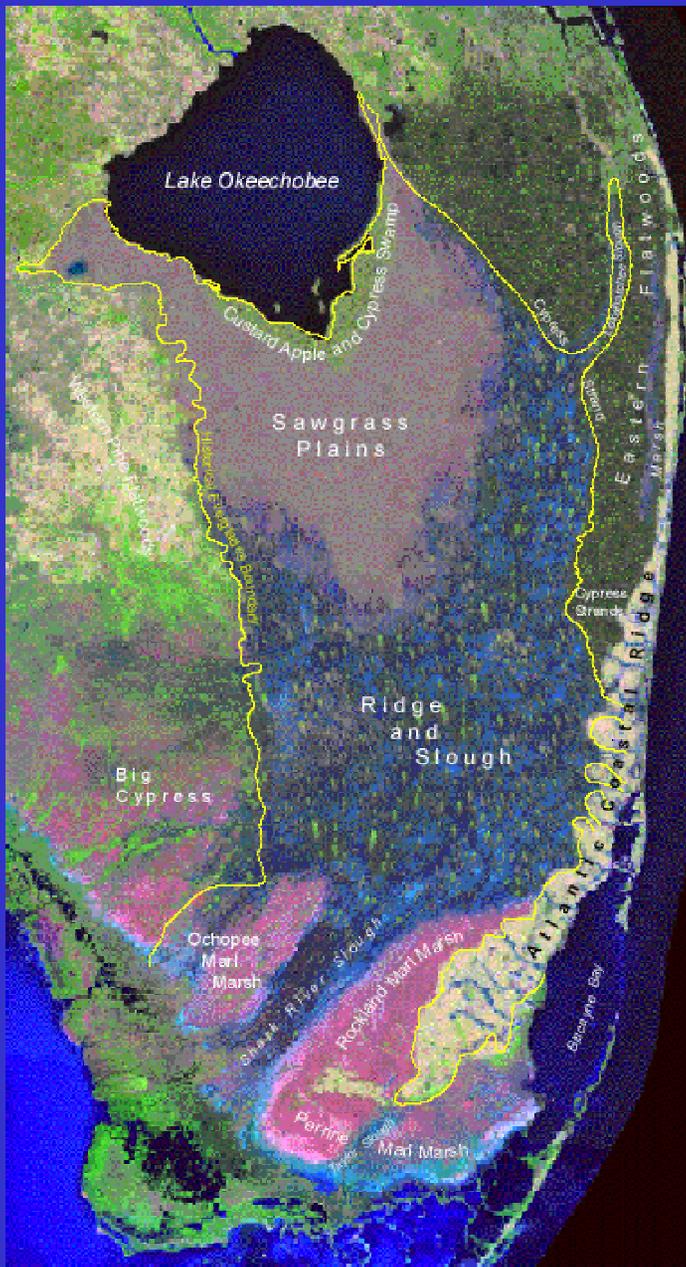
Comprehensive Everglades Restoration Plan (CERP)



**Presentation at the USACE Chemist's
Business Meeting**

**By Jeffrey R. Hendel
Jacksonville District**

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NATURAL SYSTEM (circa 1850)

MANAGED SYSTEM (1995 Landscape)

EVERGLADES

- “River of Grass”
- First and foremost, the goal of the Comprehensive Plan is to restore, protect, and preserve a natural treasure - the south Florida ecosystem

The Problem

- Too much/too little water for the Everglades/south Florida ecosystem
- Fragmentation of natural areas
- Degradation of water quality (nutrient loading)
- Population growth and increased demand
- Average of 1.7 billion gallons of water a day lost to tide



SOLUTION - CERP

- Water Resources Development Act of 1992 and 1996
- Central and Southern Florida Project Comprehensive Review Study

OBJECTIVES OF CERP

- **Improve functioning of over 2.4 million acres of the south Florida ecosystem**
- **Improve Lake Okeechobee water levels for littoral zone health**
- **Eliminate almost all damaging freshwater releases to the Caloosahatchee and St. Lucie estuaries**
- **Improve urban and agricultural water supply**
- **Improve water deliveries to Florida Bay, Biscayne Bay, and other estuaries**
- **Improve regional water quality conditions**
- **Maintain existing level of flood protection**

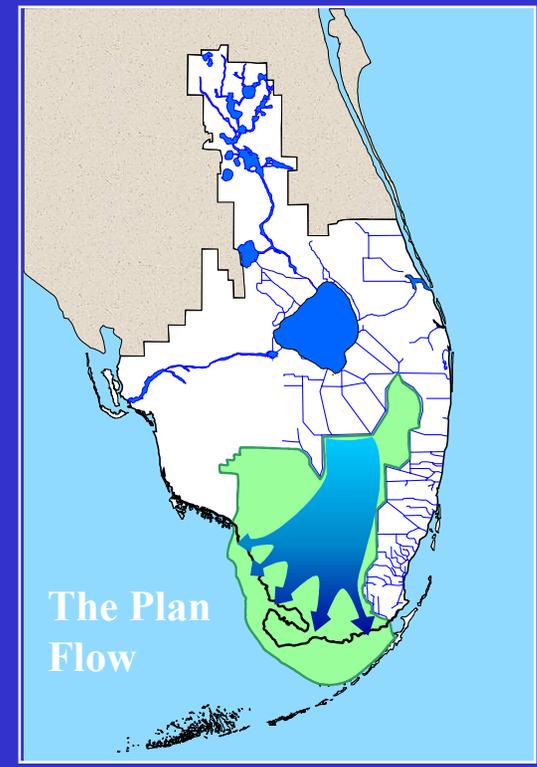
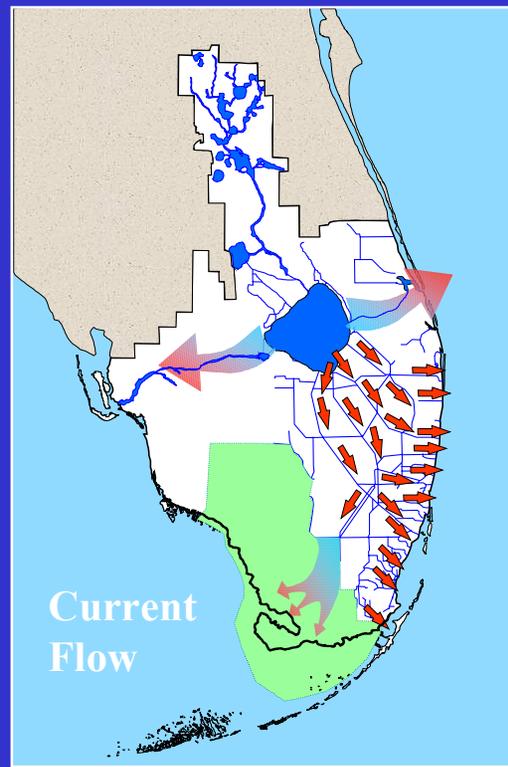
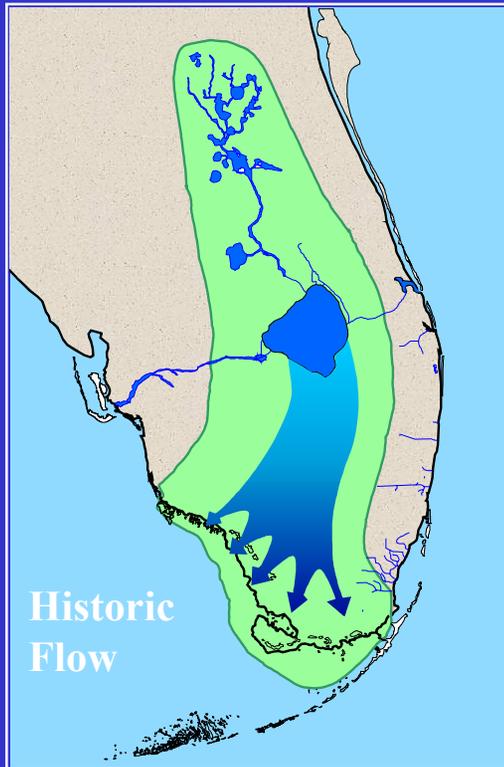
COMPONENTS OF CERP

- **6 pilot projects**
- **15 surface storage reservoirs**
- **3 in-ground reservoirs**
- **330 ASR wells**
- **19 STA's**
- **2 wastewater reuse plants**
- **Removal of over 240 miles of canals, levees and structures**
- **Operational changes**

KEY TO CERP SUCCESS IS GETTING THE WATER RIGHT



RESTORING WATER FLOW PATTERNS



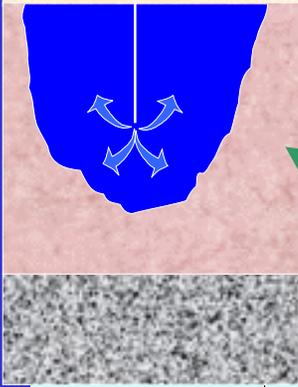
WHAT IS ASR ?

- Aquifer Storage and Recovery
- Water is injected and displaces native water in the aquifer to form a “freshwater bubble”
- Approximately 330 ASR proposed wells with a total capacity of over 1.6 billion gpd
- Target Storage Zone - Floridan Aquifer (800 - 1,200 feet bgs)

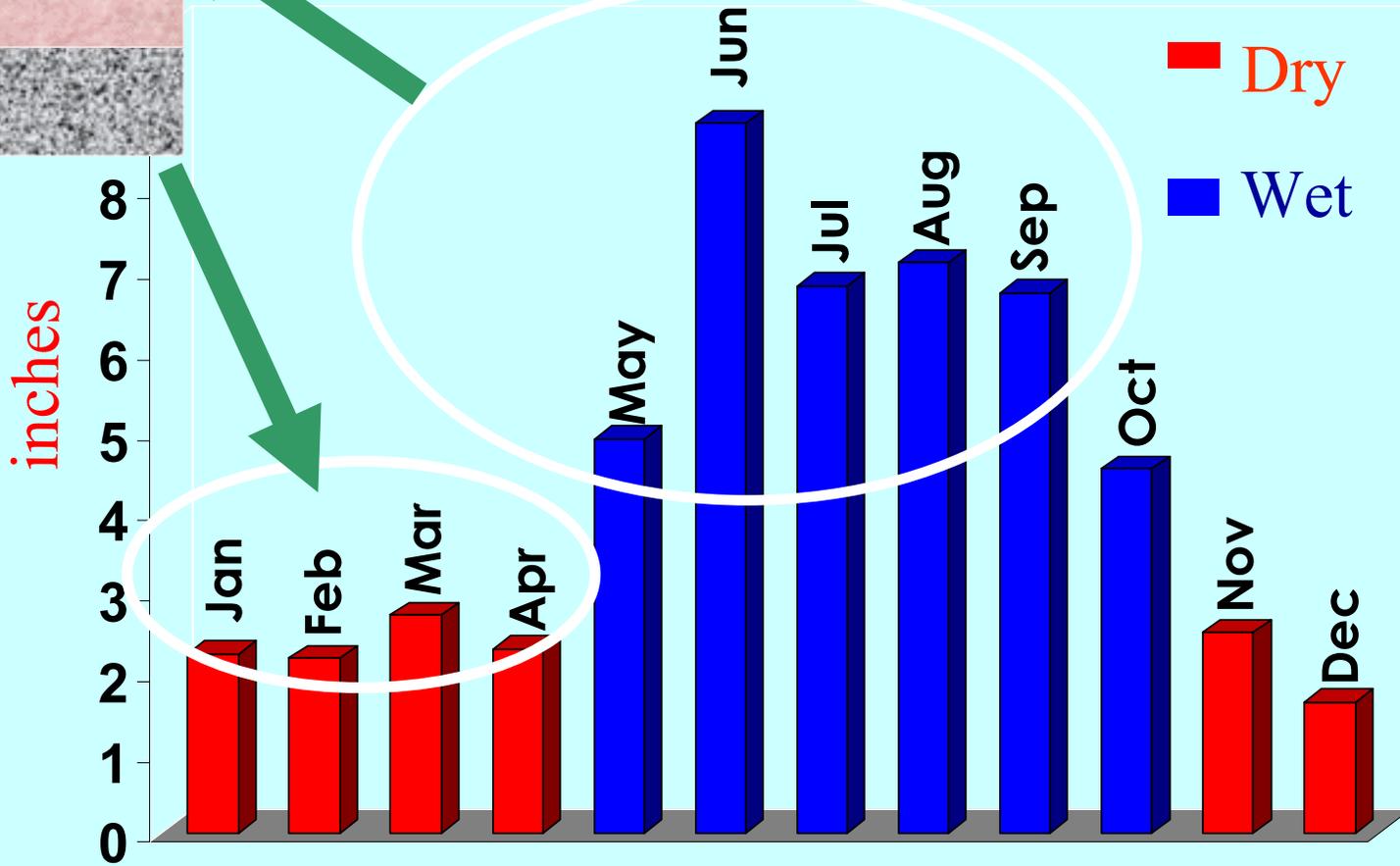
WHY ASR

- Provide longer term storage of water resource
- Cost effective compared to surface reservoirs
- Provides effective means to provide water for ecological restoration purposes, water supply and agricultural use

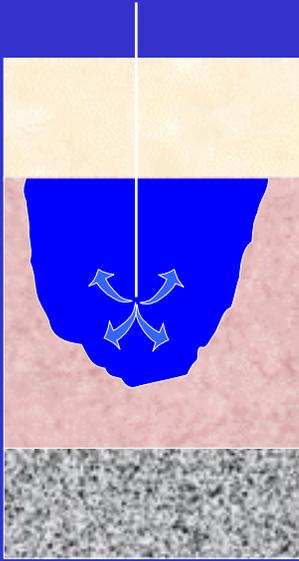
ASR Well



ASR Storage Cycle



ASR Pilot Well Locations



3 Well Adjacent to Lake Okeechobee

1 Well at the Hillsboro Canal

1 Well Caloosahatchee River



Water Quality Issues

- Multi-Agency Review/Agreements
- Sampling Requirements
- Analytical Requirements
- Scrutiny of Data

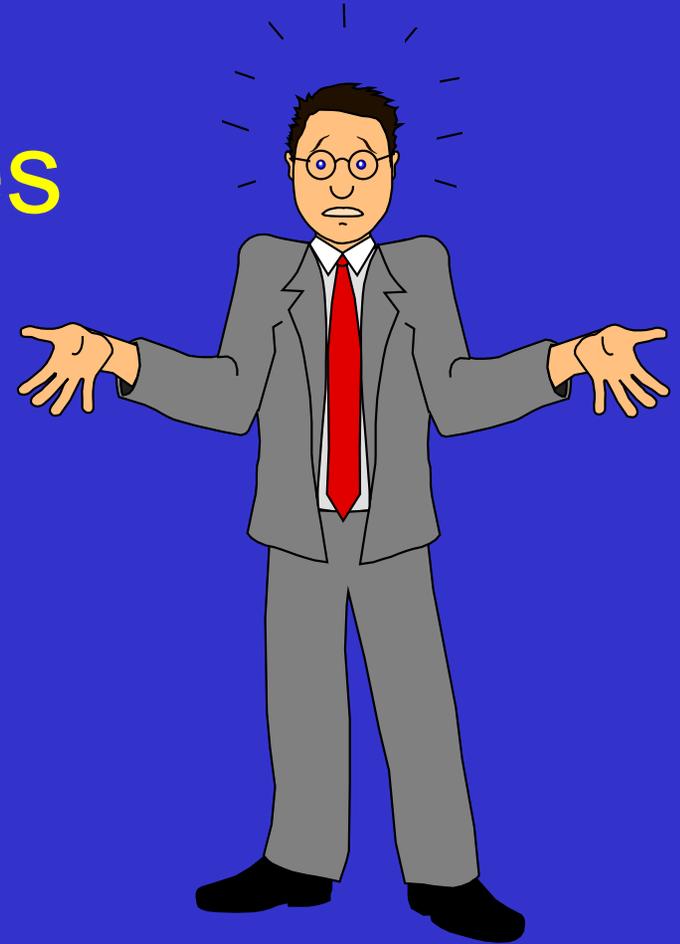
TEAM PARTICIPANTS

Multi-Agency

- U.S. Army Corps of Engineers
- South Florida Water Management District
- US Fish and Wildlife Service
- Everglades National Park
- National Marine Fisheries Service
- U.S. Environmental Protection Agency
- Natural Resources Conservation Service
- Miccosukee and Seminole Tribes
- Florida Department of Agriculture and Consumer Services
- Florida Department of Environmental Protection
- Florida Fish and Wildlife Conservation Commission
- Local Government Agencies

Challenges

- 50% Cost Sharing
- Analytical Parameters
- Analytical Methods
- Reporting Limits
- Costs
- Procuring an Analytical Laboratory



Analytical Parameters

- Drinking Water Parameters (VOCs, etc.)
- Ultra-Trace Mercury
- CyanoAlgae and associated Cyanotoxins
- Radiochemistry
- Microbiology
- Conventional Parameter (e.g., nutrients)
- Specialty Pesticides (non-routine analyses)

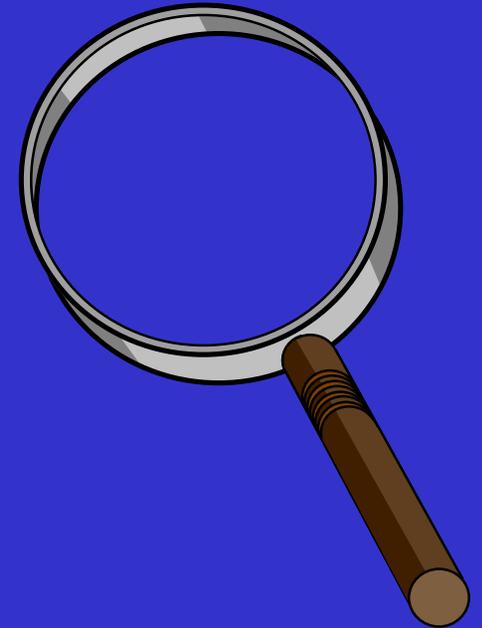
Analytical Methods

- Drinking Water Methods (12 separate methods)
- Various non-routine analytical methods for performing all requirements

Reporting Limits

- Clean Water Act (Injection Water)
 - Federal and State MCLs
- FDEP Class I and Class III Surface Water Criteria (Recovered Water)
 - discharge criteria
- Everglades Water Quality Standards
 - water entering the Everglades

Example of Select Reporting Limits



- Phosphorous - 10 ug/L
- Methyl Mercury - 0.02 ng/L
- Total Mercury - 0.05 ng/L
- Aldrin - 0.07 ng/L
- Beryllium - 4 ng/L

Ultimate Challenge was Procuring the Analytical Laboratory

- 7 Primary laboratories and 3 sub labs
- Need for specialized laboratories
- Difficult negotiations with Contractor regarding laboratory costs



Analytical Costs

- Drinking Water - \$2,240/sample
- Microbiology - \$815/sample
- Conventional Parameters - \$575/sample
- Radiological - \$753/sample
- CyanoAlgae - \$1,750/sample
- Total **\$6,133** per sample



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web site

www.evergladesplan.org

The Plan to Restore America's Everglades - Main Page - Microsoft Internet Explorer provided by...

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Rescuing an Endangered Ecosystem - The Plan to Restore America's Everglades

January 25, 2000

[en español](#)

*Why Restore
The Everglades ?*

*What Is The
Restoration Plan ?*

*What Does The
Plan Give Us ?*

*How Will The Plan
Be Implemented ?*

*How Can I
Get Involved ?*

*"There Are no other Everglades in the world."
Marjory Stoneman Douglas*

An American natural treasure is in trouble. The Everglades of today are not the same place that [Mrs. Douglas](#) wrote about in 1947. Once the Florida Everglades was a vibrant, free-flowing river of grass that provided clean water from Lake Okeechobee to Florida Bay. It was a vital haven for storks, alligators, panthers and other wildlife. Today this extraordinary ecosystem—unlike any other in the world—is dying. Over the past fifty years, people in great numbers have encroached upon the ecosystem that once was the domain of panthers, alligators and flocks of birds so vast that they would darken the sky. With the arrival of people came the desire to manage the water, to tame the



Q & A

